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10/074,992	02/13/2002	William A. Burris		6883

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BASCH & NICKERSON LLP
1777 PENFIELD ROAD
PENFIELD, NY 14526

EXAMINER

CONLEY, SEAN EVERETT

ART UNIT	PAPER NUMBER
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1797

NOTIFICATION DATE	DELIVERY MODE
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09/04/2008

ELECTRONIC

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

dneels@bnpatentlaw.com

dmasters@bnpatentlaw.com

mnickerson@bnpatentlaw.com

Office Action Summary

Application No.

10/074,992

Applicant(s)

BURRIS ET AL.

Examiner

SEAN E. CONLEY

Art Unit

1797

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 6/30/2008.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-5 and 7-32 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-5 and 7-32 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☐ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO/CDC)
- Paper No(s)/Mail Date _____

- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date _____
- 5) ☐ Notice of Informal Patent Application
- 6) ☐ Other: _____

DETAILED ACTION

Continued Examination Under 37 CFR 1.114

1. A request for continued examination under 37 CFR 1.114 was filed in this application after a decision by the Board of Patent Appeals and Interferences, but before the filing of a Notice of Appeal to the Court of Appeals for the Federal Circuit or the commencement of a civil action. Since this application is eligible for continued examination under 37 CFR 1.114 and the fee set forth in 37 CFR 1.17(e) has been timely paid, the appeal has been withdrawn pursuant to 37 CFR 1.114 and prosecution in this application has been reopened pursuant to 37 CFR 1.114. Applicant's submission filed on June 30, 2008 has been entered. Claims 1-5 and 6-32 are pending.

Response to Arguments

2. Applicant's arguments filed June 30, 2008 have been fully considered but they are not persuasive.

3. Regarding the rejection of claims 1-5 and 7-31 under 35 U.S.C. 103(a) as being unpatentable over Contreras in view of Burris '993, the Applicant argues the following:

"Considering the rejection of claims 1-5 and 7-31 under 35 USC §103(a) as being unpatentable combination of Contreras in view of Burris '993, Applicants contend that, at best, the asserted combination fails to teach the limitations of amended claim 1. In

particular the combination fails to teach a circulation system that continuously circulates liquid containing dissolved ozone to the operatory unit. Contreras is believed to teach the opposite, by stating "water flow sensor 20 to activate (turn on and off) the pump/motor 10 upon demand." (col. 3, lines 47-48). Such a teaching, in combination with a "safety pressure relief valve 24 to override any potential excess pressure on the line with a discharge hose 25 feeding back to the storage tank 2 indicates that the liquid is not re-circulated because if it were, pressure applied to the line at relief valve 24 would not be "relieved" by a connection to pressurized tank 2 through hose 25. Accordingly, the teachings of Contreras and Burris '993, both alone and in combination are believed to be overcome by the amendments presented herein. Applicants respectfully traverse the rejection in light of the amendments and seek the Examiner's indication of an allowance of amended claim 1."

The Examiner respectfully disagrees. The new limitations of the circulation system are directed to the function of the device and/or the manner of operating the device. All of the structural limitations of the claim have been disclosed by the combination of Contreras in view of Burris and the circulation system in device of Contreras is capable of continuously circulating the liquid containing dissolved ozone. Furthermore, Contreras also indicates that the ozonated water is continuously circulated throughout the system (see col. 3, lines 56-58). As such, it is deemed that the claimed apparatus is not differentiated from the apparatus of Contreras in view of Burris (see MPEP §2114).

In addition, the Applicants arguments are not commensurate in scope with the claims. Specifically, the claim does not require "re-circulation" of the liquid but instead only requires "continuous circulation". "Continuous circulation" is not the same as "re-circulation". Therefore, when there is a constant demand for liquid the circulation system of Contreras continuously supplies liquid containing dissolved ozone through the pressurized circulation passageway to provide liquid containing dissolved ozone as needed to the user.

The Applicant further argues the following:

"Furthermore, the asserted combination fails to teach a separation system that separates undissolved gas from the ozonated liquid prior to circulating the ozonated liquid through the circulation passageway, and vents said gas to atmosphere via a reducing material. Applicants again urge that neither of the patents relied upon expressly indicate such a feature. In particular, Contreras teaches a flexible tube 26 that captures and reuses any excess ozone, thus leaving no waste. (col. 4, lines 11- 15; underlining added). Such an arrangement does not vent to atmosphere via a reduction material as claimed, and in fact inserting such a vent to replace, or be put in-line with, the tube would preclude the capture and reuse taught by Contreras. Thus, the operation of the Contreras system would require modification in such a manner as to preclude a finding of obviousness. Accordingly, claim 1 is further submitted to be patentably distinguishable over the combination of Contreras in view of Burris '993."

This argument is not persuasive based on the board decision wherein it was stated:

"In order to establish a prima facie case of obviousness, the Examiner must show that each and every limitation of the claim is described or suggested by the prior art or would have been obvious based on the knowledge of those of ordinary skill in the art. In re Fine, 837 F.2d 1071, 1074 (Fed. Cir. 1988). In our view, the Examiner properly identified features in Contreras which correspond to the claimed separation means. (Ans., para. bridging 6-7). Contreras appears to separate the gas from liquid by gravity in the same manner as Appellants. Compare Finding of Fact 5 (separation system) with Specification, p. 5, 11. 29-30 ("The ozone containing gas is separated from the liquid after mixing, preferably by gravity in the treatment chamber 14"). Thus, the burden to prove that Contreras does not disclose the claimed separation means was properly shifted to Appellants. See In re Schreiber, 128 F.3d 1473, 1478 (Fed. Cir. 1997); In re Best, 562 F.2d 1252, 1255 (CCPA 1977). Merely arguing that Contreras does not teach a separation system (Reply 8) is not sufficient to satisfy this burden.

In KSR Int'l Co. v. Teleflex Inc., the Supreme Court set aside any "rigid" application of the teaching, suggestion, motivation ("TSM") test, advising that: "A person of ordinary skill is also a person of ordinary creativity, not an automaton." KSR Int'l Co. v. Teleflex Inc., 127 S. Ct. 1727, 1742 (2007). The Supreme Court clarified that while "it can be important to identify a reason that would have prompted a person of ordinary skill in the relevant field to combine the elements in the way the claimed new invention does the analysis need not seek out precise teachings [in the prior art] directed to the specific subject matter of the challenged claim." Id. at 1741. Contrary to Appellants' contention, we find that the facts and reasons relied on by the Examiner provide a reasonable basis to conclude that one of ordinary skill in the art would have been motivated to employ the ozone off-gas destruction means of Burris in the system of Contreras (see Ans. 6). Appellants argue that "it remains unclear what the Examiner relies upon for teaching [sic, teaching] such a suggestion." (Reply Br. 7). In our view, however, the Examiner clearly explained that Contreras contemplates two different modes of operation, i.e., an active mode in which ozonated water is available for use and a system shut down mode. In the active mode, a closed system is maintained and ozone gas is returned to the circulating water. (Ans. 3). However, in the shut-down mode, quick disconnect components are employed to allow access to/servicing of various system components (Finding of Fact 6), such that the system is no longer closed. (Ans. 6). The Examiner's proposed use of

Burris' ozone off-gas destruction means is limited to this shut-down mode. In other words, the Examiner proposes addition of Burris' ozone off-gas destruction means to Contreras' system for handling the ozone off-gas at system shut down, not substitution of Burris' ozone off-gas destruction means for Contreras' ozone recirculation system. We fail to see how such use is inconsistent with, or would frustrate, Contreras' goal of maintaining a closed system in the active mode as argued by Appellants (Reply Br. 7). Accordingly, we find that a preponderance of the evidence weighs in favor of the Examiner's conclusion that claims 1, 3, 7-11, 15, 18, 21, 22, and 26 are unpatentable over the combined teachings of Contreras and Burris."

With regards to claim 30, the Applicant argues the following:

"Amended independent claim 30 is also believed to be patentably distinguishable over Contreras in view of Burris '993 as neither is believed to disclose the combination of elements as now set forth in the independent claim - particularly a device control system that operates in response to a liquid level sensor. As for the Examiner's assertion of inherency, Applicants maintain that the Examiner fails to establish the inherency (i.e., necessity) of the limitations set forth in claim 30 based upon Contreras' teachings, nor the specific relationships of such limitations. Accordingly, the rejection as it may apply to amended independent claim 30 is respectfully traversed."

The Examiner disagrees. Contreras clearly discloses that the system operates in response to a liquid level sensed by water flow sensor (20) which is used to activate the pump (10) on demand. The control system includes the inherent electrical connection to the pump/motor (10) which turns the pump/motor on or off in response to the sensed condition by the water flow sensor (20). This connection is a controller that controls the device and is in communication with the water flow sensor. In addition, although Contreras does not explicitly use the term "control system", it is clear that the device

inherently has a control system because Contreras states that the system provides for automatic replenishment of fresh water whenever active-ozonated water is used (see coil. 2, lines 47-56). More specifically, the control system includes a ball valve (3) to control water flow, a float valve (4) to regulate the incoming water level, a water flow sensor (20) to activate the pump (10), and a solenoid valve (7) (see col. 2, lines 58-68; see col. 3, lines 47-50). These components all form part of a control system which ensures that the device operates as desired to produce liquid containing dissolved ozone and to circulate and output liquid containing dissolved ozone. Furthermore, the control system is capable of shutting down the device after a period of non-use. Contreras also teaches the use of multiple sensors (water flow sensor (20) and overflow safety switch (6) mounted in the tank (2)) to prevent the tank from spilling over into the environment. A solenoid valve (7) (part of the control system) will shut the incoming water into the storage tank (2) when activated by the overflow safety switch (see col. 3, lines 1-10). Thus, Contreras teaches the claimed control system and sensor.

Therefore, claims 1-5 and 7-31 remain rejected under 35 U.S.C. 103(a) as being unpatentable over Contreras in view of Burris '993.

4. Regarding the rejection of claims 1-5 , 7-16, 18-29 and 31 under 35 U.S.C. 103(a) as being unpatentable over Engelhard in view of Burris '993 the Applicant argues the following:

"Claims 1-5, 7-16, 18-29 and 31 continue to be rejected under 35 USC §103(a) as being unpatentable over Engelhard et al. in view of Burris '993. This rejection is also

respectfully traversed. Engelhard is not believed to teach or suggest an ozone mixing system, or a circulation system that continuously circulates the liquid containing dissolved ozone through a pressurized liquid circulation passageway connected to provide liquid containing dissolved ozone to the operatory unit, said circulation system including a pressure regulator to maintain positive pressure in the circulation passageway. As depicted in FIG. 1 of Engelhard, for example, it is not clear where Engelhard is alleged to teach mixing. Nor is it clear where Engelhard teaches that the system either discharges or circulates via a pump 90. Moreover, no teaching is found to indicate continuous circulation, or the use of a pressure regulator. For the reasons noted above, Burris '993 is not believed to supply the noted deficiencies noted herein relative to Engelhard. As Engelhard and Burris '993 each fail to teach the mixing and circulation limitations found in amended independent claim 1, they are also urged to be patentably distinguishable over the combination."

The Examiner respectfully disagrees. This argument is not persuasive based on the board decision wherein it was stated:

"9) Engelhard Figure 1 shows:

A liquid source, i.e., water line 14 supplies water to container 12. (Col 3, 11. 36-37).

An ozone generator 16 for producing an ozone containing gas. (Col. 3, 1. 37). Generator 16 is an ultraviolet light type generator. (Col. 3, 11. 37-39).

A protection system—"ozone enriched air flows into pipe 26 through inlet 28. A check valve 30 in pipe 26 prevents reverse flow therethrough." (Col. 3, 11. 51-53).

An ozone mixing system—"Pipe 26 is terminated by a sparger 32. The sparger emits the ozone enriched air in the form of tiny bubbles which become readily entrained in the water in and flowing through container 12." (Col. 3, 11.53-56).

A circulation system--"a return line 90 is in fluid communication with conduit 62 downstream of the last branch leading to a dental chair. Ozonated water from conduit 62 is drawn into the return line by a pump 92. The pump conveys the ozonated water through return line 94 into water line 14 upstream of inlet 15 in container 12. Thus, the ozonated water flowing through the return lines, which water may have a lowered concentration of entrained ozone, is reintroduced to the ozone generator." (Col. 4, 11. 29-37).

A separation system--"To prevent an accumulation of ozone enriched air within container 12, any such gaseous compound is evacuated through an outlet 40 leading to a gas separator 42 through a pipe 44." (Col. 3, 11. 60-63).

An ozone reducer--Outflow from the gas separator is through a pipe 46 to an ozone destructor 48. (Col. 3, 11. 63-65).

A liquid admitting system, i.e., water line 14 supplies water to container 12. (Col 3, 11.36-37)."

Furthermore, the device of Engelhard includes a pressure regulator (pump 90) (see figure 1). The limitations regarding "continuous circulation" are directed to the function of the apparatus and/or the manner of operating the apparatus. All of the structural limitations of the claim has been disclosed by the combination of Engelhard in view of Burris and the device of the combination is capable of continuous circulation (see the arrows in figure 1 which indicate circulation of liquid). As such, it is deemed that the claimed device is not differentiated from the device of Engelhard in view Burris (see MPEP §2114). Therefore, claims 1-5 , 7-16, 18-29 and 31 remain rejected under 35 U.S.C. 103(a) as being unpatentable over Engelhard in view of Burris '993.

Claim Rejections - 35 USC § 103

5. The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.

6. Claims 1-5 and 7-31 are rejected under 35 U.S.C. 103(a) as being unpatentable over Contreras U.S. patent No. 5,824,243 in view of Burris U.S. patent No. 5,207,993.

Contreras teaches a water ozonating system having a corona discharge ozone generator coupled to a water reservoir and pressurized liquid circulation system, to dispense active, disinfecting ozonated water to the circulation lines of a dental operatory unit to kill microorganisms therein. A check valve is provided to ensure that water does not reach the ozone generator, pressure control means are provided including a pump (10) for pressurized circulation and thus pressure regulation of the ozonated water. Control means are further provided to control activation, operation and delivery of the water (ball valve (3) to control water flow, a float valve (4) to regulate the incoming water level, and a water flow sensor (20) to activate the pump (10) (see col. 2, lines 58-68; see col. 3, lines 47-50). Ozone is mixed with the water in the reservoir through a diffuser and the action of the pump means and a venturi. Off gas is captured and returned to the reservoir (see the abstract, column 3, lines 35-68 and column 4, lines 11-20).

Burris et al., '993 teach a water purification device for point-of-use application wherein there is a liquid source, a corona discharge ozone generator, hydrophobic means (element (24)) for preventing access to the ozone generator by the liquid (see col. 3, lines 44-56), means for mixing the ozone and liquid, means for circulating the

ozonated liquid, means for separating excess ozone gas from the ozonated liquid and destroying that excess ozone prior to atmospheric release, and means for maintaining the liquid source. Burris et al., '993 provide a positive pressure pump for mixing and circulating the ozonated water, while teaching the equivalence of static diffusers and venturi means, as well. Burris et al., '993 teach the use of the device for provision within offices or compact location such as under sinks. See column 2, lines 40-68, column 3, lines 5-35 and 55-68, column 4, line 23 through column 5, line 35, and the figures.

It would have been well within the purview of one of ordinary skill in the art to employ the ozone off-gas destruction means of Burris in the system of Contreras, because it would provide for the safe disposal of that off-gas if the system requires abrupt shut-down which would not allow for the time consuming, natural dissipation of the off-gas as required by return of the off-gas to the reservoir.

With respect to claim 2, Contreras discloses a pressure regulation means (pump (10) for maintaining proper pressure in the liquid circulation passageway (waterlines (15) and (11)) (see col. 3, lines 10-35).

With respect to claim 4, Contreras discloses a control system (ball valve (3) to control water flow, a float valve (4) to regulate the incoming water level, and a water flow sensor (20) to activate the pump (10)) which cause the device to operate as desired to produce liquid containing dissolved ozone and to circulate and output liquid containing dissolved ozone (see col. 2, lines 58-68; see col. 3, lines 47-50; see figure).

With respect to claim 5, Contreras discloses an ozone generator (17) (see figure; see col. 3, lines 35-40) which is capable of generating more ozone than can be

dissolved in water if that is the desired intended use of the device. One could reduce the water flow using the ball valve (3) such that only a few drops of water enter the storage tank (2) and thus the ozone filling the reservoir would be more than can be dissolved in the liquid flow. Therefore, the ozone generator is of size sufficient to generate more ozone than can be dissolved in the liquid flow.

With respect to claims 12 and 13, the insertion of the ozone off-gas destruction means of Burris into the device Contreras (as stated above for the rejection of claim 1) would result in device that includes a porous hydrophobic barrier (24) that prevents any liquid from entering the ozone reducing material (26) of the ozone destruct unit. It would have been obvious to one of ordinary skill in the art to substitute the check valve protecting the ozone generator of Contreras with the porous, hydrophobic barrier means (element (24)) of Burris since during a shutdown operation the element (24) would enable ozone off-gas to pass to the destruct unit (26) while at the same time prevent water from entering the destruct unit or the ozone generator via tubing (26).

With respect to claim 14, Contreras does provide a liquid source via inlet port (1). This source of water is preferably non-pressurized, however, it does not eliminate the use of pressurized water (see col. 2, lines 57-65). Therefore, the water from the water entry line may be pressurized and thus provides at least some of the pressure to circulate and output the ozonated liquid through waterline (11) (see figure).

With respect to claim 16, Burris discloses the use of a drain (57) from a reservoir (36). Pump (53) pressurizes the circulation system and ozonated water that is not used is output through the drain (57) (see figure 9; see col. 7, lines 32-41). Therefore, it would

have been obvious to one of ordinary skill in the art at the time the invention was made to incorporate a drain line (57) into the liquid circulation line of Contreras in order to dispose of any unused ozonated water as exemplified by Burris.

With respect to claim 17, Contreras clearly teaches the use of the invention for dental operatory procedures (see abstract). Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made that use of the device in a dental operatory procedure includes fluidly connecting all necessary dental operatory equipment requiring water, including a cuspidor drain structure, to the water ozonating system, in order to ensure that the surfaces and sources of water are clean and sterile.

With respect to claims 19, 20, and 25, Burris discloses a control system (30) which includes an ozone sensor (25) and an alarm to indicate that the system is not functioning properly. The activation of the alarm results in the ozone generator shutting down (see col. 4, lines 23-33). Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the system of Contreras and employ a control system comprising an ozone sensor and alarm as exemplified by Burris in order to ensure that the water contains dissolved ozone. Furthermore, the control system is capable of shutting down the pump system (20) in response to a lack of supply water (see col. 4, lines 33-34).

With respect to claims 23-24, Burris discloses the use of dried air that has passed through a dryer to help keep moisture out of the ozone generator (see col. 3, lines 7-10). Therefore, it would have been obvious to one of ordinary skill in the art at

the time the invention was made to employ a dryer and supply dried air to the ozone generator of Contreras as exemplified by Burris in order to prevent moisture from getting into the ozone generator. Furthermore, the limitations of claim 24 are directed to functional language and do not impart any patentable structure to the device. The dry air of Burris used in the system of Contreras is capable of being dried by a desiccant protected from moist air by valves when the device is not being operated.

With respect to claims 27-29, Contreras clearly discloses that the device may be used in dental operatory procedures for supplying sterile water (see abstract). It is well known that in dental operatory procedures the dental tools are air powered and often used in combination with water dispensing/rinsing devices. Thus, it is obvious that when the device of Contreras is used in a dental operatory procedures an ozonated water dispensing means (for example, a nozzle having a valve for turning on and off) would be connected to the device and furthermore is located very near air powered dental handpieces. It should be noted that the limitations of claim 29 do not further limit the structure of the claimed device. The claimed device does not require a source of air pressure, but only a valved dispensing means that is responsive to air pressure. A valved dispensing means that is responsive to air pressure is inherently disclosed by Contreras when the device is used in a dental operatory procedure.

With respect to claim 30, Contreras teaches a water ozonating system having a corona discharge ozone generator coupled to a water reservoir and pressurized liquid circulation system, to dispense active, disinfecting ozonated water to the circulation lines of a dental operatory unit to kill microorganisms therein. A check valve is provided

to ensure that water does not reach the ozone generator, pressure control means are provided including a pump (10) for pressurized circulation and thus pressure regulation of the ozonated water. Control means are further provided to control activation, operation and delivery of the water (ball valve (3) to control water flow, a float valve (4) to regulate the incoming water level, and a water flow sensor (20) to activate the pump (10) (see col. 2, lines 58-68; see col. 3, lines 47-50). Ozone is mixed with the water in the reservoir through a diffuser and the action of the pump means and a venturi. Off gas is captured and returned to the reservoir (see the abstract, column 3, lines 35-68 and column 4, lines 11-20). Although Contreras does not explicitly use the term "control means" it is clear that the device inherently has control means because Contreras states that the system provides for automatic replenishment of fresh water whenever active-ozonated water is used (see col. 2, lines 47-56). More specifically, the control system includes a ball valve (3) to control water flow, a float valve (4) to regulate the incoming water level, a water flow sensor (20) to activate the pump (10), and a solenoid valve (7) to shut off the water supply in response to activation of overflow switch (6) (see col. 2, lines 58-68; see col. 3, lines 1-10, 47-50). These components all form part of a control system which ensures that the device operates as desired to produce liquid containing dissolved ozone and to circulate and output liquid containing dissolved ozone. Furthermore, the control system is capable of shutting down the device after a period of non-use. Contreras discloses the use of multiple sensors (water flow sensor (20) and overflow safety switch (6) mounted in the tank (2)) to prevent the tank from spilling over into the environment. A solenoid valve (7) (part of the control system) will

shut the incoming water into the storage tank (2) when activated by the overflow safety switch (see col. 3, lines 1-10). Thus, Contreras teaches the claimed control system and sensor.

Burris et al., '993 teach a water purification device for point-of-use application wherein there is a liquid source, a corona discharge ozone generator, hydrophobic means (element (24)) for preventing access to the ozone generator by the liquid (see col. 3, lines 44-56), means for mixing the ozone and liquid, means for circulating the ozonated liquid, means for separating excess ozone gas from the ozonated liquid and destroying that excess ozone prior to atmospheric release, and means for maintaining the liquid source. Burris et al., '993 provide a positive pressure pump for mixing and circulating the ozonated water, while teaching the equivalence of static diffusers and venturi means, as well. Burris et al., '993 teach the use of the device for provision within offices or compact location such as under sinks. See column 2, lines 40-68, column 3, lines 5-35 and 55-68, column 4, line 23 through column 5, line 35, and the figures.

It would have been well within the purview of one of ordinary skill in the art to employ the ozone off-gas destruction means of Burris in the system of Contreras, because it would provide for the safe disposal of that off-gas if the system requires abrupt shut-down which would not allow for the time consuming, natural dissipation of the off-gas as required by return of the off-gas to the reservoir.

With respect to claim 31, although Contreras does not explicitly use the term "control means" it is clear that the device inherently has control means because Contreras states that the system provides for automatic replenishment of fresh water

whenever active-ozonated water is used (see coil. 2, lines 47-56). More specifically, the control system includes a ball valve (3) to control water flow, a float valve (4) to regulate the incoming water level, a water flow sensor (20) to activate the pump (10), and a solenoid valve (7) to shut off the water supply in response to activation of overflow switch (6) (see col. 2, lines 58-68; see col. 3, lines 1-10, 47-50). These components all form part of a control system which ensures that the device operates as desired to produce liquid containing dissolved ozone and to circulate and output liquid containing dissolved ozone. Furthermore, the control system is capable of shutting down the device after a period of non-use. Contreras discloses the use of multiple sensors (water flow sensor (20) and overflow safety switch (6) mounted in the tank (2)) to prevent the tank from spilling over into the environment. A solenoid valve (7) (part of the control system) will shut the incoming water into the storage tank (2) when activated by the overflow safety switch (see col. 3, lines 1-10). Thus, Contreras teaches the claimed control system and sensor.

7. Claims 1-5 and 7-16, 18-29 and 31 are rejected under 35 U.S.C. 103(a) as being unpatentable over Engelhard et al., U.S. patent No. 5,942,125 in view of Burris '993.

Engelhard et al., teach substantially the invention as claimed, namely an ozone generator connected to a source of Compressed air and a water line, with means to mix ozone and water to provide an active, ozonated water for distribution to the circulation lines of a dental operatory unit. Pressure control and monitoring means are provided as well as ozone sensors, and the operation of the system is controlled based on those

measured parameters. Off gas is sent through means to destroy any residual ozone prior to release to the atmosphere. Means are also provided to protect the ozone generator from contact with water. The ozone generator of Engelhard et al. is an UV generator. See column 2, lines 33-40, column 3, lines 35-68, column 4, lines 10-20 and lines 31-43, and column 5, lines 10-35. Burris is applied as set forth above.

It would have been well within the purview of one of ordinary skill in the art to substitute the corona discharge ozone generation means of Burris for the UV generator of Engelhard et al., because of their conventionally recognized functional equivalence.

With respect to claim 5, Engelhard discloses an ozone generator (16) which is capable of generating more ozone than can be dissolved in water if that is the desired intended use of the device. One could reduce the water flow such that only a few drops of water enter the tank (12) and thus the ozone filling the tank (12) would be more than can be dissolved in the liquid flow (see col. 3, lines 35-56; see figures 1-2). Therefore, the ozone generator is of size sufficient size to generate more ozone than can be dissolved in the liquid flow.

With respect to claim 8, Engelhard discloses the use of a sparger (32) to inject ozone into the water. The sparger (32) functions as a static mixer (see figures 1-2; see col. 3, lines 50-56).

With respect to claim 13, it would have been obvious to one of ordinary skill in the art to substitute the check valve protecting the ozone generator of Engelhard et al., with the porous, hydrophobic barrier means of Burris because it would provide a more

simply means of protecting the generator irrespective of the pressure within the system and without mechanically moving parts.

With respect to claim 14, Engelhard discloses that water is introduced into the system via water line (14) (see figure 1; see col. 3, lines 35-38). All water is under some amount of pressure as it is introduced. Therefore, the pressure in the water is capable of providing pressure to circulate and output the ozonated fluid if so desired.

With respect to claims 16 and 17, Engelhard discloses a drain (70) connected to a waste line (82) capable of functioning as claimed (see figure 1; see col. 4, lines 21-42).

With respect to claim 19 and 25, Burris discloses a control system (30) which includes an ozone sensor (25) and an alarm to indicate that the system is not functioning properly. The activation of the alarm results in the ozone generator shutting down (see col. 4, lines 23-33). Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the system of Engelhard and employ a control system comprising an ozone sensor and alarm as exemplified by Burris in order to ensure that the water contains dissolved ozone. Furthermore, the control system is capable of shutting down the pump system (20) in response to a lack of supply water (see col. 4, lines 33-34).

With respect to claim 23, Burris discloses the use of dried air that has passed through a dryer to help keep moisture out of the ozone generator (see col. 3, lines 7-10). Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to employ a dryer and supply dried air to the ozone generator of

Engelhard as exemplified by Burris in order to prevent moisture from getting into the ozone generator.

With respect to claims 27-29, Engelhard teaches that the ozonated water produced within container (12) is discharged into conduit (62). The conduit serves as a water line to provide ozonated water to a manifold attached to each dental chair and in fluid communication with dental implements and other devices that normally discharge the water received (i.e. valved dispensers) (see col. 4, lines 10-20). It should be noted that the limitations of claim 29 do not further limit the structure of the claimed device. The claimed device does not require a source of air pressure, but only a valved dispensing means that is responsive to air pressure.

With respect to claim 31, Engelhard discloses a control system (electronics assembly (34) connected to a suitable power source and thus provides control of the ozone generator. The electronics assembly (34) is capable of turning the device off in response to a period of non-use (see col. 3, lines 57-63).

8. Claims 1 and 32 are rejected under 35 U.S.C. 103(a) as being unpatentable over Burris ('993) in view of Contreras.

Burris Figure 5 shows "an in-line system for pumping liquid from a reservoir to a purified liquid container while contacting the liquid with ozone to ensure its purification." (Col. 1, 11. 60-63). The system 35 includes:

A liquid source, i.e., reservoir 36, which can be refilled on a batch basis preferably via trap 37 or from a pressurized supply line. (Col 5, 11. 28-29; col. 7, 11.35-37);

An ozone generator 15 for producing an ozone containing gas. (Col. 2, 11. 56-58). Generator 15 is preferably a corona discharge generator. (Col. 2, 11.62-64).

A protection system, check valve 18, "that allows gas to pass through but prevents any liquid backflow from reaching generator 15." (Col. 2, 11. 59-62).

An ozone mixing system, pumping system 20, "contacts the liquid with ozone containing gas from generator 15 so that the liquid is purified." (Col. 2, 11. 46-49).

A circulation system, i.e., circulation loop, draws liquid from reservoir 36 via line 16 through pumping system 20 (which is a pressure regulator) and returns purified liquid to the reservoir via line 41. Therefore, the circulation system re-circulates liquid containing dissolved ozone and is capable of continuous circulation (Col. 5, 11. 59-67).

A separation system, i.e., reservoir 36, for separating gas and liquid from the ozonated liquid prior to circulation. (Col. 5, 11. 24-25).

A reducing system, i.e., ozone reducer 23, containing a material for reducing the concentration of ozone in any gas entering the atmosphere. (Col. 3, 11.25-27).

A liquid admitting system, i.e., trap 37, for adding liquid to reservoir 36. (Col. 7, 11.4-5).

However, Burris fails to explicitly disclose the point of use application of the ozonated water generated by the device.

Contreras teaches a water ozonating system having a corona discharge ozone generator coupled to a water reservoir and pressurized liquid circulation system, to dispense active, disinfecting ozonated water to the circulation lines of a dental operatory unit to kill microorganisms therein (see abstract).

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to connect the outlet of the device disclosed by Burris to an operatory unit in order to supply the operatory unit with sterile water as exemplified by the device of Contreras whom teaches that it is well known to generate sterilize ozonated water for use in operatory units.

Conclusion

9. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Sean E. Conley whose telephone number is 571-272-8414. The examiner can normally be reached on M-F 8:30-5:00.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Jill Warden can be reached on 571-272-1267. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

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August 28, 2008

/Sean E Conley/
Primary Examiner, Art Unit 1797